Compressed Gas Safety

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Basic Compressed Gas Safety

- This training is designed to help you identify hazards of compressed gas.
- If you spot problems with storage of compressed gas cylinders you should report it to your supervisor or lab director immediately.

Definitions

- Compressed Gas. Any material or mixture contained at a pressure of 40 psi at 70 degrees F or 104 psi at 13 degrees F. Any liquid material having a pressure exceeding 40 psi at 100 degrees F.
- Handling. An activity which the employee is involved in the storage, transportation or use of compressed gas cylinders.

Definitions

- Housekeeping. Maintaining the general cleanliness of the work area, which includes the proper and safe storage of all compressed gas cylinders.
- Inflation Gas System. A system in which gas is delivered, stored and discharged to consumer piping. The system includes stationary or moveable containers, pressure regulators, safety relief devices, interconnection piping and controls.

Compressed Gas Procedures

- Employees shall visually inspect compressed gas cylinders upon delivery and before each use.
- Damaged cylinders shall be marked and the supplier shall be contacted to arrange for disposal.
- Smoking, eating or drinking shall be prohibited in compressed gas storage and working areas.

Compressed Gas Procedures

- Work and storage area should be kept in a clean and orderly condition at all times.
- Employees shall ensure that the compressed containers that they are working with carry legible labels or markings identifying the contents.
- Containers not bearing any legible written identification shall not be used.

Compressed Gas Procedures

- Compressed gas cylinders shall not be rolled or stored on their side, dragged or slid.
- Where removable caps are provided by the supplier for valve protection, the user shall keep such caps on containers, except when containers are connected to dispersing units.

Compressed Gas Procedures

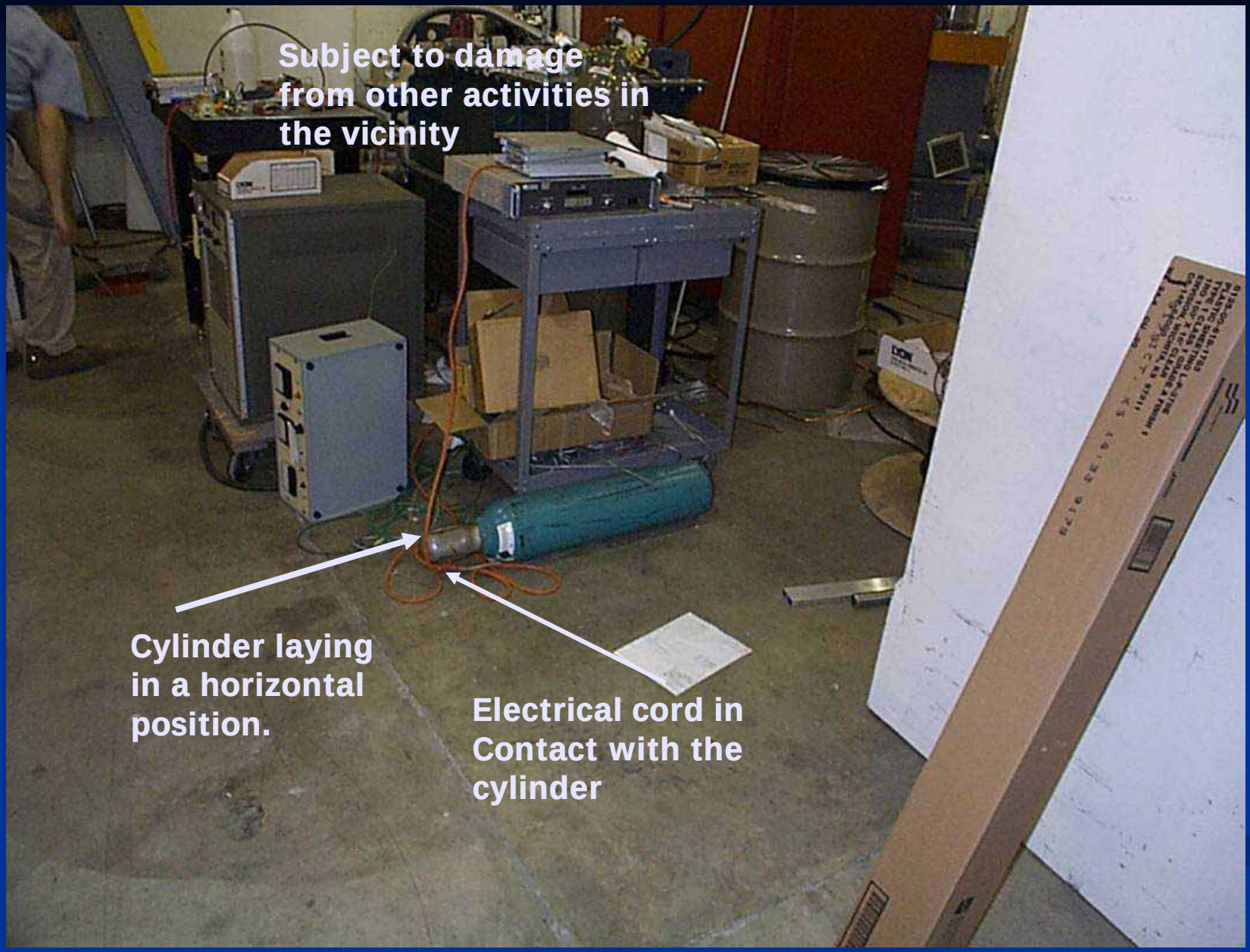
- Compressed gas cylinders shall be stored upright (valve end up) and shall be secured with approved restraining device.
- The user shall keep container valves closed at all times when not in use.
- Empty cylinders shall be legibly marked as empty.
- Cylinders shall not be lifted by their caps.

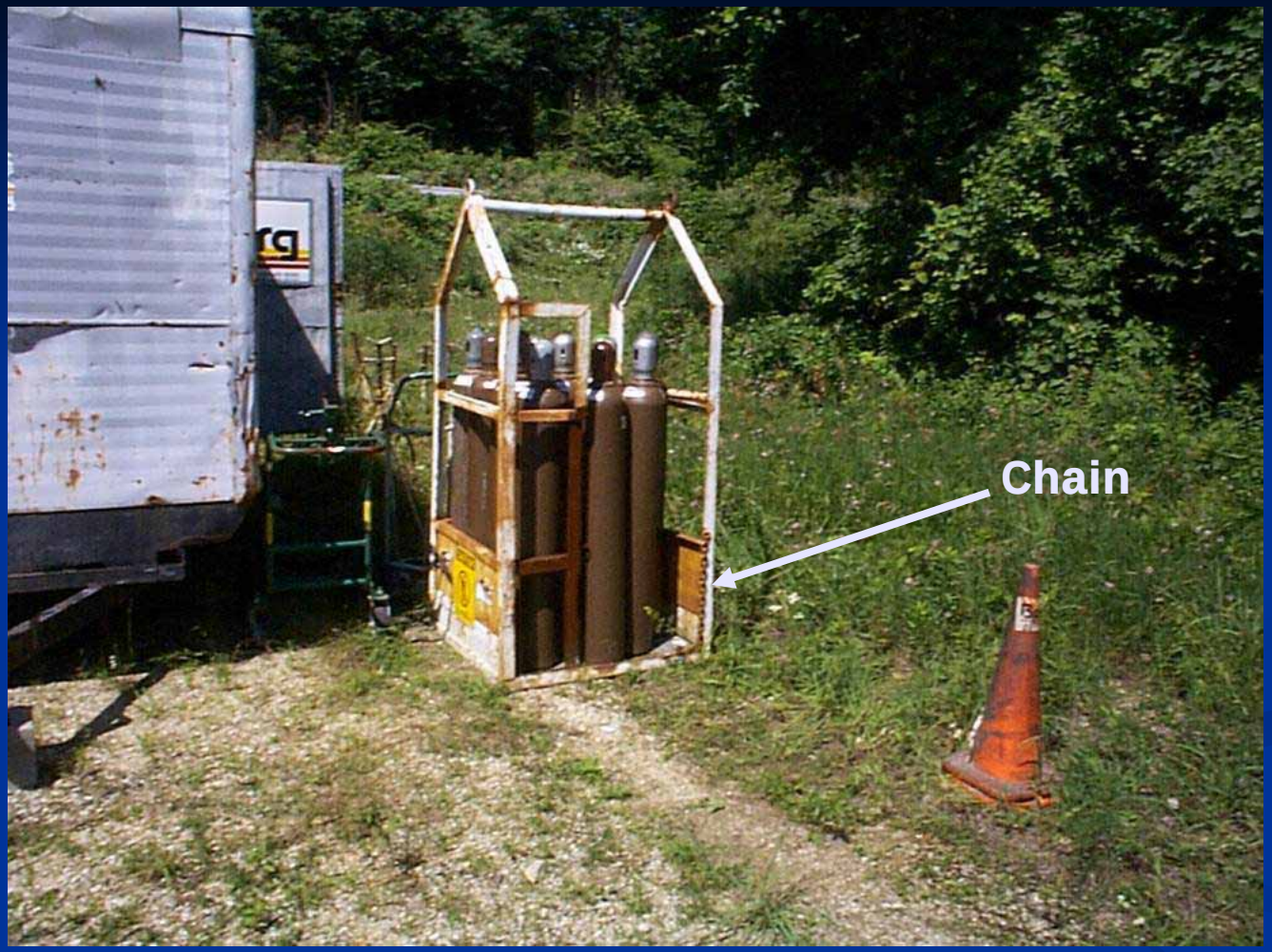
Compressed Gas References

- American National Standards Institute, ANSI 248.1-1954, ANSI B31.1-1967, ANSI UL 407-1995
- U.S. Department of Labor, Occupational Safety and Health Administration, 29CFR 1910.101

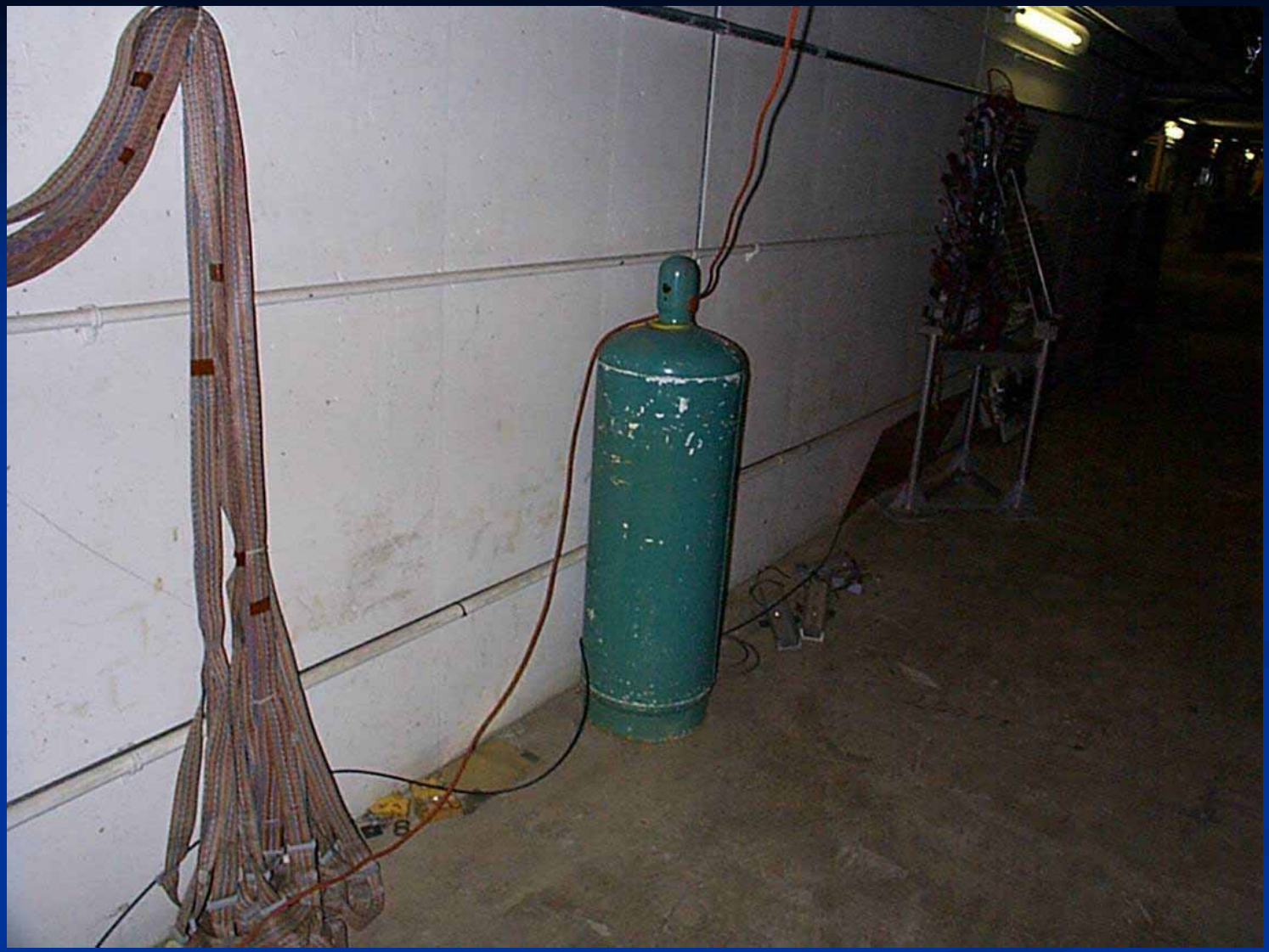
Basic Compressed Gas Safety

- The rest of the slides in this presentation are used as the “what is wrong with this picture?” segment.


Subject to damage from other activities in the vicinity
Cylinder laying in a horizontal position.
Electrical cord in Contact with the cylinder



Cylinders are not protected from falling. Note that the Chain is not secured across.



1. Cylinder not secured
2. Cylinder should be stored
3. Subject to damage.
4. Electrical cord draped over.

1. Small cylinder not tied off

2. Combustibles stored with cylinders

3. Bad housekeeping

4. Acetylene and Oxygen stored too close together and no chain.

1. Cylinder with no valve or cap installed
2. Lying horizontal on the ground
3. Subject to damage.

Cylinder is damaged. Should be taken out of service immediately!

Cylinder should be in storage protected from damage and not laying on the ground regardless if it is full or empty

Old, corroded cylinder that should have been disposed of a long time ago.

1. Cylinders laying on the ground and improperly stored
2. Subject to damage from forklift operation in vicinity

1. Feed line exposed to damage/leak that could cause a fire/explosion
2. Tripping Hazard

1. Inadequate housekeeping
2. Valve caps should be installed.

1. Unsecured acetylene cylinder 2. Exposed to damage

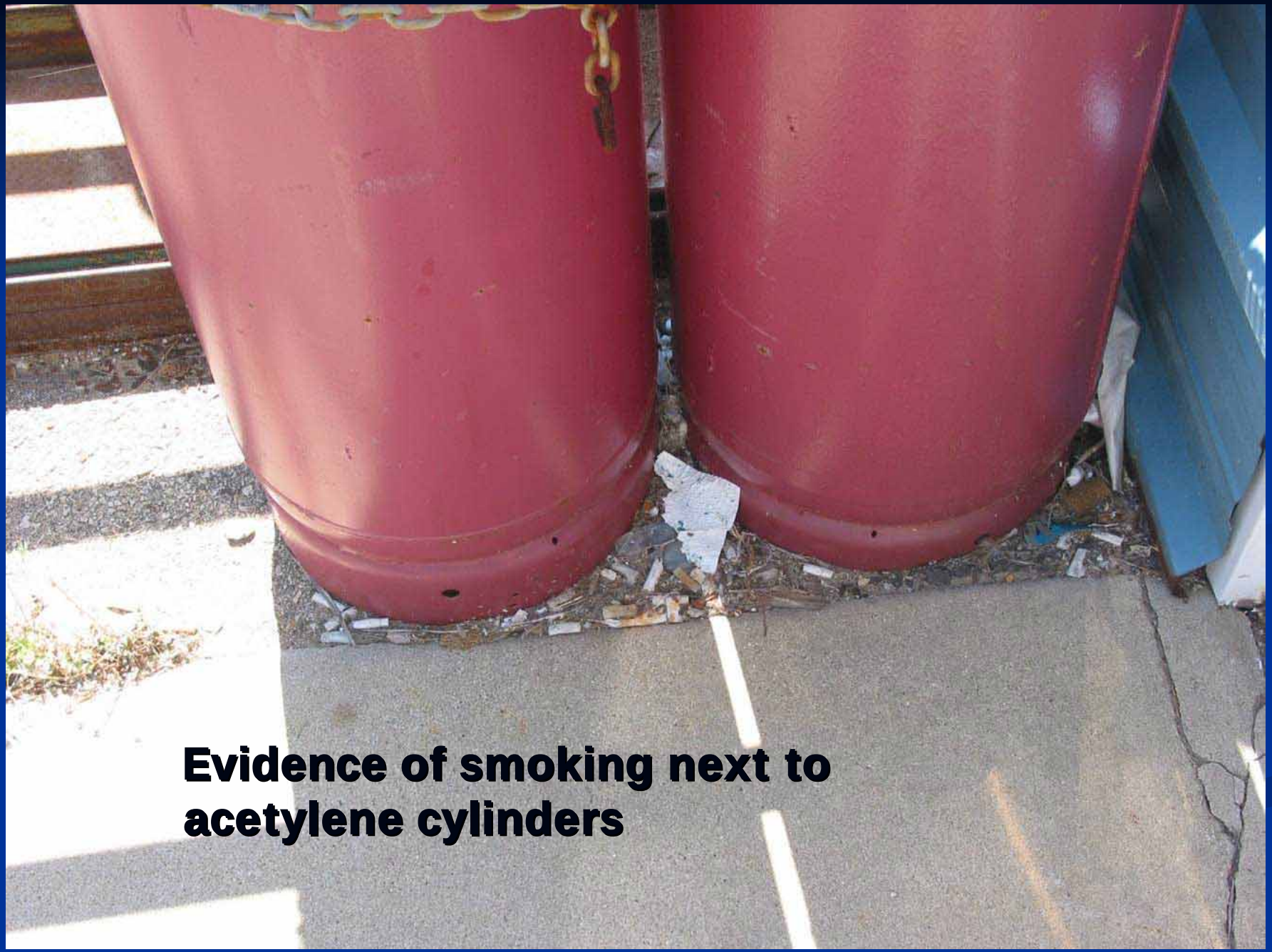

WM
Unsecured cylinders

Regulator left pressurized after use

Improper Storage

Tie Off?

Improper storage of cylinders- acetylene and oxygen stored next to each other

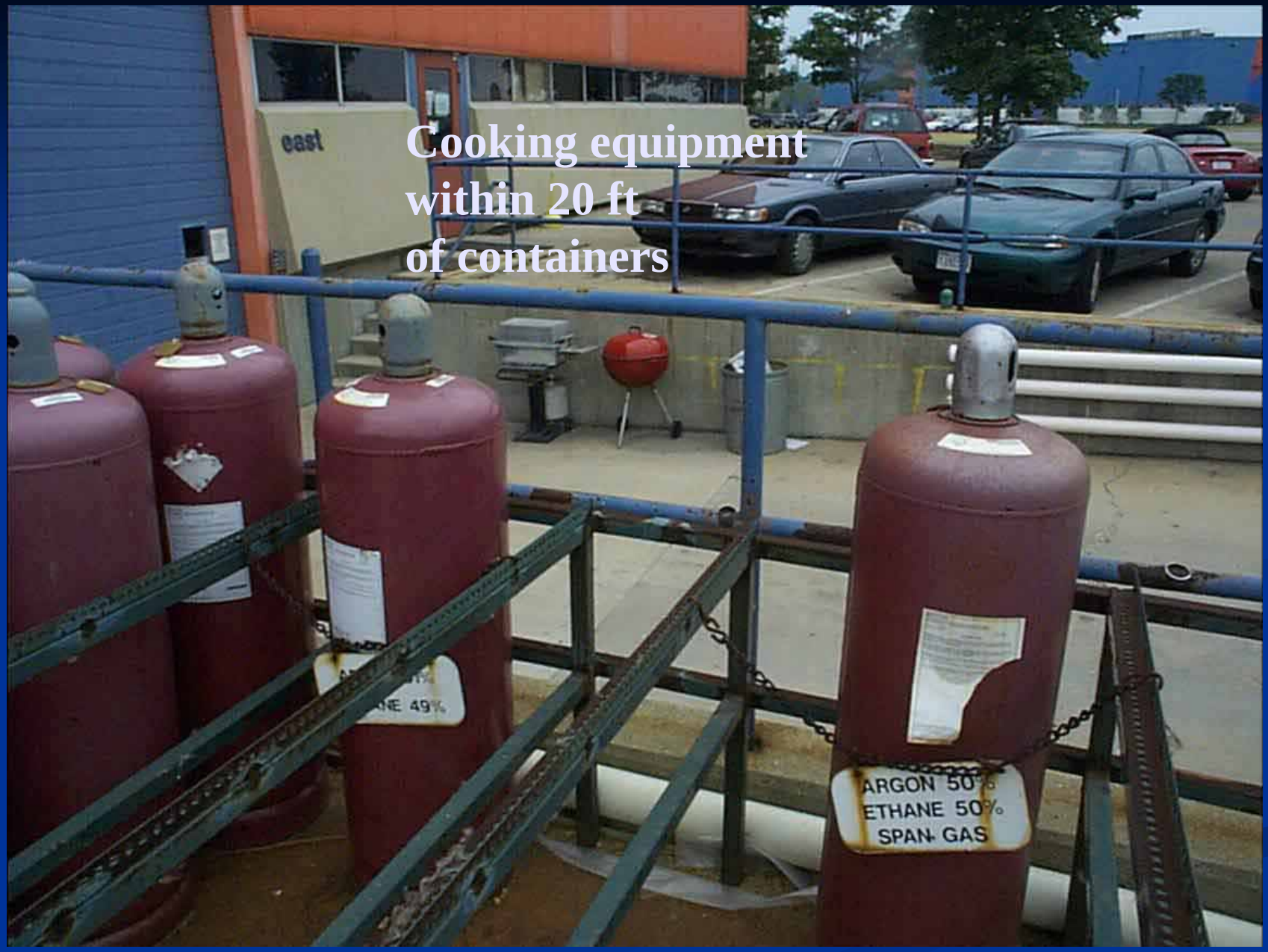


Evidence of smoking next to acetylene cylinders

This cylinder should be taken to storage and housekeeping should be improved.


OXYGEN
IN
Unsecured
cylinder


Unsecured Cylinder


Cooking equipment
within 20 ft
of containers
east
ARGON 50%
ETHANE 50%
SPAN GAS


Not Tied
Tied
HYDROGE
UN1049


Oxy-acetylene torch connected to bottles without the torch connected.

No cap installed

Housekeeping

Not in use. Should be Stored.


Cylinder not in use
with regulators still
On the cylinder
Free standing
cylinder


Free standing
cylinder


Free standing cylinders
Chain

Cylinder tied only with a bungee cord


Cylinders not
Secured properly


Exposed to damage
From construction
Activities in area
Free standing
cylinders


Free standing
cylinders


Cylinder laying on its side


What a pressurized
Container can do
When the right amount
of heat is applied.

How not to blow yourself up

Or, the importance of using flashback arrestors on oxy-acetylene carts and keeping spark producing activities <u>Away From You</u> (min 35 ft.).

An Ironworker crew was modifying a temporary structural steel bridge using an Oxygen/Acetylene torch setup on a cart, a portable welder, and a grinder. Apparently the Acetylene hose developed a leak and ignited during the grinding operation (Monday June 18, 2001)

The torch setup was not equipped with a "flashback" arrestor check valve and the fire traveled through the hose into the compressed cylinder.

All Oxygen / Acetylene setups must have a "Flashback" arrestor check valve at the regulators, NOT the torch head, to prevent this type of occurrence. This little device would have prevented this fire.

Compressed Gas Safety

If you have any questions or concerns please contact the MASC Regional Safety Manager at (303) 497-3912 or at Rhonda.S.Carpenter@noaa.gov.